

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) ~~An isolated~~ A *Piscirickettsia salmonis* 45 Kda (<sup>Px</sup>p45) protein ~~or~~ recombinant polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4 ~~comprising at least one conservative amino acid substitution.~~

Claims 2-3 (Canceled)

4. (Previously Presented) The recombinant polypeptide of claim 1 that is a chimeric protein.

5. (Cancelled)

6. (Currently Amended) An isolated or recombinant nucleic acid encoding a the isolated <sup>Px</sup>p45 protein ~~or recombinant polypeptide of claim 1~~ comprising the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4.

7. (Currently Amended) ~~The~~ An isolated or recombinant nucleic acid of ~~claim 6~~ comprising [[a]] the nucleotide sequence selected from the group consisting of SEQ ID NO: 1 and SEQ ID NO: 3 of SEQ ID NO: 1 or SEQ ID NO: 3.

8. (Cancelled)

9. (Previously Presented) An expression vector, comprising the nucleic acid of claim 7, and a transcriptional control sequence, wherein the nucleic acid is operatively linked to the transcriptional control sequence.

10. (Previously Presented) A host cell that comprises the expression vector of claim 9.

11. (Previously Presented) A method for producing a  $P_{\text{sp45}}$  recombinant polypeptide comprising culturing the host cell of claim 10 in a culture medium, wherein the host cell expresses the nucleic acid encoding the recombinant  $P_{\text{sp45}}$  polypeptide; and whereby the recombinant  $P_{\text{sp45}}$  polypeptide is produced.
12. (Previously Presented) The method of claim 11 wherein the host cell is an *E. coli* cell.
13. (Previously Presented) A method of obtaining a purified recombinant  $P_{\text{sp45}}$  polypeptide comprising purifying the recombinant polypeptide produced by the method of claim 12 from the culture medium.
14. (Previously Presented) The purified recombinant  $P_{\text{sp45}}$  polypeptide obtained by the method of claim 13.
15. (Previously Presented) A recombinant *Yersinia ruckeri* cell comprising the expression vector of claim 9.
16. (Previously Presented) The recombinant *Yersinia ruckeri* cell of claim 15 that has the BCCM accession No. of LMG P-22044.
17. (Cancelled)
18. (Currently Amended) A vaccine that comprises the isolated  $P_{\text{sp45}}$  protein or recombinant  $P_{\text{sp45}}$  polypeptide of claim 1.
19. (Currently Amended) A vaccine that comprises the nucleic acid of claim 6 expression vector of claim 61.
20. (Previously Presented) A vaccine comprising the recombinant *Yersinia ruckeri* cell of claim 15.

21. (Previously Presented) The vaccine of claim 20, wherein said recombinant *Yersinia ruckeri* cell is a bacterin.

22. (Previously Presented) A vaccine comprising the recombinant *Yersinia ruckeri* cell of claim 16.

23. (Previously Presented) The vaccine of claim 22, wherein said recombinant *Yersinia ruckeri* cell is a bacterin.

Claims 24-48 (Canceled)

49. (Previously Presented) A vaccine that comprises the expression vector of claim 9.

Claims 50-60 (Canceled)

61. (New) An expression vector, comprising the nucleic acid of claim 6, and a transcriptional control sequence, wherein the nucleic acid is operatively linked to the transcriptional control sequence.

62. (New) A host cell that comprises the expression vector of claim 61.

63. (New) The host cell of claim 62 wherein the host cell is an *E. coli* cell.

64. (New) The vaccine of claim 18 further comprising an antigen obtained from an Infectious Pancreatic Necrosis (IPN) virus, wherein the antigen obtained from the IPN virus is selected from the group consisting of a VP2 var protein, aVP3 protein, and a combination thereof.

65. (New) The vaccine of claim 19 further comprising an antigen obtained from an Infectious Pancreatic Necrosis (IPN) virus, wherein the antigen obtained from the IPN virus is selected from the group consisting of a VP2 var protein, aVP3 protein, and a combination

thereof.

66. (New) The vaccine of claim 61 further comprising an antigen obtained from an Infectious Pancreatic Necrosis (IPN) virus, wherein the antigen obtained from the IPN virus is selected from the group consisting of a VP2 var protein, aVP3 protein and a combination thereof.

67. (New) The vaccine of claim 64 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20069 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20071.

68. (New) The vaccine of claim 65 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20069 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20071.

69. (New) The vaccine of claim 66 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20069 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20071.

70. (New) The vaccine of claim 64 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20070 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20072.

71. (New) The vaccine of claim 64 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20070 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20072.

72. (New) The vaccine of claim 64 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20070 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20072.

73. (New) A method of protecting a salmonid fish from salmonid rickettsial septicemia

comprising administering to the fish the vaccine of claim 18.

74. (New) A method of protecting a salmonid fish from salmonid rickettsial septicemia comprising administering to the fish the vaccine of claim 19.

75. (New) A method of protecting a salmonid fish from salmonid rickettsial septicemia comprising administering to the fish the vaccine of claim 49.

76. (New) The vaccine of claim 64 that further comprises an antigen obtained from *Aeromonas salmonicida*.

77. (New) The vaccine of claim 65 that further comprises an antigen obtained from *Aeromonas salmonicida*.

78. (New) The vaccine of claim 66 that further comprises an antigen obtained from *Aeromonas salmonicida*.

79. (New) A <sup>Ps</sup>p45 recombinant polypeptide that consists essentially of at least 95% of the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4.

80. (New) An isolated or recombinant nucleic acid encoding a <sup>Ps</sup>p45 recombinant polypeptide consisting essentially of the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4.

81. (New) A <sup>Ps</sup>p45 recombinant polypeptide consisting essentially of the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4 with at least one conservative amino acid substitution.

82. (New) The <sup>Ps</sup>p45 recombinant polypeptide of claim 81 wherein the at least one conservative amino acid substitution is selected from the group consisting of:

- (1) a substitution of Lys for Arg;

- (2) a substitution of Arg for Lys;
- (3) a substitution of Glu for Asp;
- (4) a substitution of Asp for Glu;
- (5) a substitution of Ser for Thr;
- (6) a substitution of Thr for Ser;
- (7) a substitution of Gln for Asn;
- (8) a substitution of Asn for Gln;
- (9) a substitution of Ile for Leu
- (10) a substitution of Ile for Val;
- (11) a substitution of Leu for Ile; and
- (12) a substitution of Leu for Val.